

CLAIMS

- 1 Method for the preparation of a polymeric matrix having particulate material entrapped in said matrix in which the polymeric matrix is porous and the particles are well accessible and maintain their functionality after preparation, said method
- 5 comprising providing a mixture of polymeric material and particulate material in a solvent for the polymeric material and extruding said mixture into a fibre and solidify said fibre by a two-step phase inversion process.
- 2 Method according to claim 1 in which the mixture that is extruded comprises
- 10 0.5% to 50% by weight polymeric material and 1% to 95% by weight particulate material, the remainder being solvent.
- 3 Method according to claim 1 or 2 in which the solvent used is selected from N-methyl-pyrrolidone(NMP), dimethyl acetamide (DMAc), dimethylformamide (DMF),
- 15 dimethylsulfoxide (DMSO), tetrahydrofurane (THF),  $\epsilon$ -caprolactam or 4-butyrolactone.
- 4 Method according to any of the preceding claims in which the solvent in the mixture of polymeric material and particulate material is replaced by 0.01-50% by weight of one or more additives and/or non-solvents.
- 20 5 Method according to claim 4 in which the additives are selected from octanol, polyvinylpyrrolidone (PVP), polyethylene glycol (PEG), and glycerol.
- 6 Method according to any of the preceding claims in which the fibre comprises
- 25 5-95% by weight of polymeric material and 5-95% by weight of particulate material.
- 7 Method according to any of the preceding claims in which the fibre comprises about 60-95% by weight of particulate material.
- 30 8 Method according to any of the preceding claims in which the two-step phase inversion process involves the use of a spinneret, which allows for the controlled flow of a liquid, a vapor or a gas as an exterior medium of the fibre.

- 9        Method according to claim 8 in which the exterior medium is a liquid mixture of solvent and nonsolvent for the polymer.
- 5        10       Method according to claim 8 in which the exterior medium is a gas stream comprising a nonsolvent for the polymer.
- 11       Method according to claim 9 or claim 10 in which the nonsolvent is water or water vapor,
- 10       12       Method according to any of claims 8-11 in which a triple layer spinneret is used.
- 13       Method according to any of the preceding claims in which the polymeric material is selected from polyethersulphone, polysulfone, polyethylene-co-vinylalcohol, polyvinylidenefluoride and cellulose acetate.
- 15       14       Method according to any of the preceding claims in which the particulate material in the porous matrix is altered in its function by a subsequent functionalisation.
- 20       15       Method according to any of the preceding claims in which the particulate material is adsorptive particulate material.
- 16       Method according to claim 16 in which the adsorptive particulate material is an ion exchange resin.
- 25       17       Method according to claim 16 in which the adsorptive particulate material is hydrophobic in nature.
- 30       18       Method according to any of the preceding claims in which the particulate material is used for size exclusion.

- 19      Method according to any of the preceding claims in which the particulate material is used for separation of isomeric compounds.
- 20      Method according to any of the preceding claims in which the particulate material is used for separation of optically active compounds.
- 21      Method according to any of the preceding claims in which the particulate material is used in reversed phase chromatography.
- 22      Method according any of the preceding claims in which the particulate material is functionalised, or is subsequently functionalised, with a catalyst or a biocatalyst.
- 23      Method according to any of the preceding claims in which the particulate material is active carbon.
- 24      Method according to any of the preceding claims in which for mechanical enforcement a thread, wire, yarn or the like of any material is co-extruded with the fibre.
- 25      Method according to any of the preceding claims which further comprises heat treatment.
- 26      Method for controlling porosity of a polymeric matrix having particulate material entrapped in said matrix by varying the size of the particulate material in the method according to claim 1.
- 27      Method for controlling porosity of a polymeric matrix having particulate material entrapped in said matrix by varying the content of the particulate material in the method according to claim 1.

- 28      Method for controlling porosity of a polymeric matrix having particulate material entrapped in said matrix by varying the functionality of the particulate material in the method according to claim 1.
- 5      29      Fibre obtainable by the method according to any of the preceding claims.
- 30      Module comprising fibre according to claim 29 said module comprising a spirally wound fibre mat packed inside a housing, a bundle of fibers packed longitudinally inside a housing, a transverse flow fiber configuration inside a housing,
- 10      fibre wounded as a spool in parallel or cross-over mode inside a housing or any other orderly or disorderly fibre packing configuration inside a housing.
- 31      Body comprising a fibre, optionally in a finely divided form, according to claim 29.
- 15      32      Use of a fibre according to claim 29 or a module according to claim 30 or a body according to claim 31 for the adsorption and/or purification of compounds from a mixture of compounds or a reaction mixture, in particular from a fermentation broth, tissue broth, plant broth or cell broth in general.
- 20      33      Use of a fibre according to claim 29 or a module according to claim 30 or a body according to claim 31 for the immobilisation of a catalyst in a reaction mixture.
- 34      Use of a fibre according to claim 29 or a module according to claim 30 or a
- 25      body according to claim 31 for the immobilisation of a chemical or biological compound.